What Is Claimed Is:

1. A track servo control method for following an optical beam to a track of an optical storage medium that is formed tracks comprised of a plurality of sectors having ID parts shaped as a relief structure, comprising:

a step of observing a positional error of the optical beam from said track by a reflected light from said optical storage medium;

a step of controlling an actuator for moving said optical beam by a feedback control system according to said observed positional error;

a step of inputting a signal based on said observed positional error and learning a signal waveform synchronizing with the period of said ID parts; and

a step of inputting said learning result to said feedback control system and controlling the vibration of said actuator by periodic noise synchronizing with the period of said ID parts,

wherein said learning step comprises a step of subtracting the learning result from the learning input and learning the learning signal after subtraction.

2. The track servo control method according to Claim 1, wherein said learning step comprises a step of learning a signal waveform synchronizing with the period of the ID parts of a zone adjacent to the zone of the track where said optical beam follows up out of a plurality of zones divided

for each of said plurality of tracks of said optical storage medium.

3. The track servo control method according to Claim 2, wherein said learning step comprises:

a step of learning a signal waveform synchronizing with the period of the ID parts of the zone adjacent to the inside when the track of the zone where said optical beam follows up is inside from the center of the follow-up zone; and

a step of learning a signal waveform synchronizing with the period of the ID parts of the zone adjacent to the outside when the track is outside from the center of the follow-up zone, out of the plurality of zones divided for each of said plurality of tracks of said optical storage medium.

4. The track servo control method according to Claim 3, wherein said learning step further comprises a step of detecting whether said track to be followed up is inside or outside from the center of the follow-up zone by the follow-up start track position of said optical beam.

5. The track servo control method according to Claim 3, wherein said learning step further comprises a step of detecting whether said track to be followed up is inside or outside from the center of the follow-up zone by the follow-

up start track position of said optical beam and the rotation frequency of said optical storage medium from said follow-up start.

6. The track servo control method according to Claim 1, wherein said control step comprises a step of subtracting said learning result from the signal of said feedback control system.

7. The track servo control method according to Claim 6, wherein said learning step comprises a step of learning a signal waveform synchronizing with the period of said ID parts using the signal based on said observed positional error as an input for the command value of said feedback control system, and

said control step comprises a step of subtracting said learning result from the command value of said feedback control system.

8. The track servo control method according to Claim 6, wherein said learning step comprises a step of learning a signal waveform synchronizing with the period of said ID parts using the signal based on said observed positional error as an input for the input signal of said feedback control system, and

said control step comprises a step of subtracting said learning result from the input signal of said feedback

control system.

9. The track servo control method according to Claim 6, wherein said learning step comprises a step of learning a signal waveform synchronizing with the period of said ID parts using the signal based on said observed positional error as an input for the command value of said feedback control system and outputting the learning result where phase has advanced, and

said control step comprises a step of adding said learning result to the command value of said feedback control system.

10. A track servo controller for following an optical beam to a track of an optical storage medium that is formed tracks comprised of a plurality of sectors having ID parts shaped to be a relief structure, comprising:

detection means for observing the positional error of said optical beam from said track by the reflected light from said optical storage medium;

a feedback control means for controlling an actuator for moving said optical beam by a feedback control system according to said observed positional error; and

a learning control means for learning a signal waveform synchronizing with the period of said ID parts from a signal based on said observed positional error, and inputting said learning result to said feedback control

system to control the vibration of said actuator by periodic noise synchronizing with the period of said ID parts,

wherein said learning control means subtracts the learning result from the learning input and learns the learning signal after subtraction.

11. The track servo controller according to Claim 10, wherein said learning control means learns a signal waveform synchronizing with the period of the ID parts of a zone adjacent to the zone of the track where said optical beam follows up out of a plurality of zones divided for each one of said plurality of tracks of said optical storage medium.

12. The track servo controller according to Claim 11, wherein said learning control means learn a signal waveform synchronizing with the period of the ID parts of the zone adjacent to the inside when the track of the zone where said optical beam follows up is inside from the center of the follow-up zone and with the period of the ID parts of the zone adjacent to the outside when the track is outside from the center of the follow-up zone out of the plurality of zones divided for each of said plurality of tracks of said optical storage medium.

13. The track servo controller according to Claim 12, wherein said learning control means detect whether said

track to be followed up is inside or outside from the center of the follow-up zone by the follow-up start track position of said optical beam.

14. The track servo controller according to Claim 13, wherein said learning control means detect whether said track to be followed up is inside or outside from the center of the follow-up zone by the follow-up start track position of said optical beam and the rotation frequency of said optical storage medium from said follow-up start.

15. The track servo controller according to Claim 10, wherein said learning control means subtract said learning result from the signal of said feedback control system.

16. The track servo controller according to Claim 15, wherein said learning control means learn a signal waveform synchronizing with the period of said ID parts using the signal based on said observed positional error as an input for the command value of said feedback control means, and subtracts said learning result from the command value of said feedback control means.

17. The track servo controller according to Claim 15, wherein said learning control means learn a signal waveform synchronizing with the period of said ID parts using the signal based on said observed positional error as an input

for the input signal of said feedback control means, and subtracts said learning result from the input signal of said feedback control means.

18. The track servo controller according to Claim 15, wherein said learning control means learn a signal waveform synchronizing with the period of said ID parts using the signal based on said observed positional error as an input for the command value of said feedback control means, outputs the learning result where phase has advanced, and adds said learning result to the command value of said feedback control means.

19. An optical storage device for at least reading the information of a track of an optical storage medium that is formed tracks comprised of a plurality of sectors having ID parts shaped to be a relief structure, comprising:

an optical head having an actuator for moving said optical beam; and

a track servo controller for controlling said actuator so that the optical beam follows up said track,

wherein said track servo controller comprises:

detection means for observing the positional error of said optical beam from said track by the reflected light from said optical storage medium;

a feedback control means for controlling the actuator by a feedback control system; and

a learning control means for learning a signal waveform synchronizing with the period of said ID parts from a signal based on said observed positional error, inputting said learning result to said feedback control system to control a vibration of said actuator by periodic noise synchronizing with the period of said ID parts, and

wherein said learning control means subtracts the learning result from the learning input, and learns the learning signal after subtractions.

20. The optical storage device according to Claim 19, wherein said learning control means learn a signal waveform synchronizing with the period of the ID parts of a zone adjacent to the zone of the track where said optical beam follows up out of a plurality of zones divided for each one of said plurality of tracks of said optical storage medium.